

### **AMENDMENTS TO THE SPECIFICATION**

Please replace paragraph [0017] with the following rewritten paragraph:

Figure 11[[a]] shows a simplified cross-sectional view of the cross-channel area of the microfluidic device of Figure 10.

Please replace paragraph [0038] with the following rewritten paragraph:

Figure 5 shows the fluid flow through the microfluidic device 200, similar to microfluidic device 100 shown in Figures 3a and 3b. A source fluid sample 226a-c, containing two molecules, enters the upper microfluidic channels 204a-c at the input reservoir 212a-c and flows toward the cross-channel area 208n. A carrier fluid sample 228a-c enters the lower channel 106 at the input reservoirs 216a-c and flows toward the cross-channel areas 208n. At the cross-channel areas 208n, a portion of the sample fluid 226 will flow through or attach to the porous membrane 210, causing a reaction, such as a potential change in an optical and/or electrical characteristic of the porous membrane 210. Such a characteristic change may be measured in the manners described below.

Please replace paragraph [0051] with the following rewritten paragraph:

Next, in a block 504, a porous silicon (PSi) film (or porous polysilicon (PPSi) film) is physically separated by electropolishing “lift-off” from the PSi-etched or PPSi-deposited silicon and suspended in solution. Alternatively, PPSi film may be formed when directly deposited on a substrate (*e.g.*, silicon, quartz, *etc.*), and can be physically separated by any of various standard etching or micromachining techniques. The PSi or PPSi film is then secured within a corresponding recess formed in a substrate half proximate to a cross-channel area in a block [[706]] 506.